Malaysia Trip Report:
A Training Course on Health of Tropical Forest Trees

John Kliejunas and Cynthia Ash
USDA Forest Service, Forest Health Protection

Background

At its February 4th, 2003 meeting, IUFRO Working Party 7.02.07 – Diseases of Tropical Forest Trees – noted the need for tree pathologists in the tropics. Although 57 researchers were listed as tropical forest pathologists with the Working Party, the majority were from developed countries such as Australia, Japan, and the United States, with only 10 from South East Asia. The Working Party, chaired by forest pathologist Dr. Su See Lee of Malaysia, proposed that a training course/workshop for tropical tree pathologists be held before the next IUFRO World Congress in 2005.

With the urging of Dr. Lee and support from the Forest Research Institute Malaysia (FRIM), the Asian Pacific Association of Forestry Research Institutions (APFRI) and USDA International Forestry (IF) and Forest Health Protection (FHP), a training course on Health of Tropical Forest Trees was proposed. The intent of the course was to provide young researchers from South East Asia countries with some basic skills in, and competencies and understanding of, tropical tree disease recognition, monitoring and management. Dr. Sim Heok-Choh, Executive Director of APFRI and located at FRIM, worked with FRIM and Gary Man from IF, to establish the course and solicit students. International Forestry provided a grant to support the course.

Originally, Centre for Agriculture and Biosciences International (CABI) was to provide the lead for the training, with FHP contributing a pathologist to support CABI in presentation of the course. Because funding for CABI did not materialize, FHP provided funding for two FHP pathologists (John Kliejunas, Pacific Southwest Region; and Cynthia Ash, Northeastern Area) to design and teach the course.

We spent March 29-April 14 in Malaysia with course preparation, course presentation, and several days post-training searching for possible Phytophthora-infected plants in high elevation oak and ericaceous native forests.

The Course

The training course, "Health of Tropical Forest Trees" was held April 4-8, 2005 at FRIM, Kepong, Malaysia. FRIM is located 16 km northwest of Kuala Lumpur, on a 600 hectare site surrounded by the Bukit Lagong Forest Reserve. The objectives of the course were to:

1. Develop skills in tree disease recognition and monitoring
2. Improve visual diagnostic skills
3. Understand the basics of tree disease management and control
4. Improve networking, communication, and information exchange

The 16 students from six different countries included three individuals from the Philippines (two university extension associates from the University of the Philippines at Los Banos, and one science research specialist with the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development), two from Vietnam (one forest pathologist with the Forest Science Institute in Hanoi, and one lecturer at Nong Lam University in HoChiMinh City), two from Peoples Republic of China (assistant professors from the Research Institute of Tropical Forestry, Chinese Academy of Forestry), one from Laos (forestry technical officer from the Forestry Research Center), one from Thailand (research assistant in the Department of Forest Biology at Kasetsart University), one from Indonesia (lecturer at Bogor Agricultural University), and six from Malaysia (one research officer from Sabah; three assistant directors and one forest plantation officer from Forest Department Peninsular Malaysia; and one research officer from FRIM).

Fig. 1. Students and facilitators attending the April 4-8, 2005 Health of Tropical Forest Trees training course, FRIM, Malaysia. Included with the group are Dr. Sim Heok-Choh (second row, far right), Dr. Daniel Baskaran Krishnapillay (next to Sim), and Mohd. Farid Ahmad (first person, second row), associate of Dr. Su See Lee (first row, far right).

The five day course included lectures from us and Dr. Lee; student presentations and discussions of their work in their home countries; laboratory exercises; field diagnostic, evaluation and management exercises; and a one day field trip to the FRIM Research Station in Bidor to examine, diagnose, and discuss nursery and other tree problems. The establishment of a Listserv for use by the students upon return to their home countries to further networking and discussions of mutual tree health problems was agreed to.

Fig. 2. Classroom session.

Fig. 3. Diagnosing root disease.

Fig. 4. Signs and symptoms.

Fig. 5. Graduation.

At the conclusion of the course, students received Certificates of Completion. They were also presented with a CD containing all presentations made throughout the session. The CD included a selection of digital images taken by Farid Ahmad.

Opening and Closing remarks were given by Dr. Daniel Baskaran Krishnapillay, senior director of the Biotechnology Division, FRIM.

Phytophthora Search

Following completion of the course, we spent several days traveling in higher elevation native forests examining vegetation for symptoms of *Phytophthora* spp. infection. We were accompanied by Dr. Lee, Farid, and forester Zac. ELISA kits (Neogen ALERT® for *Phytophthora*) and selective medium (PARP) were taken to the field. Initial screening of symptomatic plant tissues were done with ELISA. Some tissues were plate on PARP directly in the field; others were collected, placed in a cooler, and plated the same evening.

The first day was spent at Fraser's Hill (Bukit Fraser). The mountain resort, a former British hill station, is situated in West Malaysia's main mountain range (Titiwangsa

Range), mostly in the state of Pahang partly in the state of Selangor, at an elevation of 1,500 meters. The rainforest vegetation includes many species of Fagaceae. There are 65 species of Fagaceae in Malaysia. Several hiking trails were taken. Leaves of the native *Castanopsis inermis* (Berangan), family Fagaceae, and the exotic invasive *Clidemia hirta* (Koster's Curse) in the Melastomataceae with marginal necrosis were collected and plated on PARP. ELISA samples were also ran on leaves from the two species.

The second day was spent examining ericaceous and other plants in remnant forest of the Gentling Highlands casino/resort area of Pahang, at an elevation of 1,700 meters; and members of the Fagaceae in the lower elevation area of Gombak at the outskirts of Kuala Lumpur.

At Gentling Highlands, the following were sampled with ELISA and plated on PARP:
1. leaves of *Gaultheria leucocarpa* (Eriacaceae)
2. leaves of *Eriobotrya bengalensis* (Rosaceae)
3. leaves of *Rhododendron robinsonii* (Eriacaceae)
4. margins of stem cankers on three *Rhododendron robinsonii*

In addition, leaves of *Ficus deltoidea* var. *intermedia* (Moraceae) were tested with ELISA.

At Gombak, margins of stem canker tissue from a *Lithocarpus ewyckii* (Mempening, Chinese oak), family Fagaceae, were plated on PARP.

Leaf tissue of *Lithocarpus ewyckii* with marginal necrosis collected from FRIM was plated on PARP the third day.

Most ELISA reactions were inconclusive. The strength of the reaction in all tests was highly variable. All ELISA strips gave a weak positive reaction, even when a healthy philodendron leaf was used. Tissue from *Rhododendron robinsonii* leaves with marginal necrosis gave a moderate reaction; *R. robinsonii* is native to the Malaysia peninsula and is available commercially in the United States.

We returned to the United States on April 14, 2005.

Any possible *Phytophthora* spp. growing from tissues on the PARP plates were transferred to pure culture on PARP in Dr. Lee's laboratory and sent to Beltsville for identification.

Acknowledgements

The support and hospitality received from Dr. Sim Heok-Choh and Dr. Su See Lee during our visit was exceptional, and very much appreciated.